

**First Professional MBBS Degree Regular/Supplementary Examinations  
August 2025**

**Physiology - Paper II**

**Time: 3 Hours**

**Total Marks: 100**

- *Answer all questions to the point neatly and legibly • Do not leave any blank pages between answers*
- *Indicate the question number correctly for the answer in the margin space*
- *Answer all parts of a single question together • Leave sufficient space between answers*
- *Draw table/diagrams/flow charts wherever necessary*

**1. Multiple Choice Questions**

**(20x1=20)**

**The responses for MCQ questions (Q.No. i to Q.No. xx) shall be written in the space provided for answering MCQ questions at page No. 51 of the answer book (the inner portion of the back cover page (PART III)). Responses for MCQs marked in any other part/page of the answer book will not be valued**

**Question numbers i-v are case scenario-based questions:**

A middle aged male with a hyperfunctioning thyroid nodule underwent a complete thyroidectomy. Postoperatively, he complained of circumoral numbness and tingling. Examination showed a normal pulse rate, body temperature, and blood pressure. Applying pressure to the cuff caused muscular spasm below it. The consultant instructed the duty doctor to tap the face just below the zygomatic bone and order lab tests for serum calcium, phosphate, and PTH levels.

- i. The probable cause of case would be
  - a) Deficiency of Calcitonin
  - b) Deficiency of Thyroxin
  - c) Deficiency of PTH
  - d) Deficiency of Iodine
- ii. Which of the following is the most likely laboratory finding in this patient post-thyroidectomy
  - a) High serum calcium and phosphate
  - b) Low serum calcium and phosphate
  - c) High serum calcium and low phosphate
  - d) Low serum calcium and high phosphate
- iii. What clinical sign is being tested when the duty doctor taps the face just below the zygomatic bone
  - a) Trousseau's sign
  - b) Chvostek's sign
  - c) Babinski's sign
  - d) Kernig's sign
- iv. An increase in serum calcium level above the normal triggers the release of
  - a) Parathormone (PTH)
  - b) Calcitriol
  - c) Calcitonin
  - d) Thyroxin
- v. The primary action of Calcitriol (1,25-dihydroxycholecalciferol) is
  - a) Decrease calcium absorption in the intestines
  - b) Increase calcium absorption in the intestines
  - c) Decrease calcium reabsorption in the kidneys
  - d) Increase phosphate excretion in the kidneys

**For Questions vi-x there are two statements marked as - Assertion (A) and Reason (R). Mark your answer as per the options provided**

- a) **A is correct R is incorrect**
  - b) **A is incorrect R is correct**
  - c) **Both A & R are correct and R is the reason for A**
  - d) **Both A & R are correct and R is not reason for A**
- vi. **Assertion:** Synaptic transmission in chemical synapse is unidirectional.  
**Reason:** The presynaptic terminal releases neurotransmitters, which bind to specific receptors located only on the postsynaptic membrane.
  - vii. **Assertion:** In skeletal muscle the twitch duration is shorter in fast muscle fibres in comparison with slow muscle fibres.  
**Reason:** On the basis of duration of their twitch contraction, motor units are divided into slow and fast units.
  - viii. **Assertion:** In myopia, the distant objects appear blurred or unclear.  
**Reason:** Image is formed behind the retina.
  - ix. **Assertion:** In Acromegaly Bitemporal hemianopia may occur.  
**Reason:** Pituitary adenoma compresses optic chiasm.
  - x. **Assertion:** The duration of spinal shock is more in humans than frogs and cats.  
**Reason:** The duration of spinal shock is proportionate to the degree of encephalization of motor functions in various species.

**(PTO)**

**Question numbers xi-xv are multiple response type questions. Read the statements and mark the answers appropriately.**

- xi. The following are features of cerebellar disorder.  
1) Dysarthria    2) Dysmetria    3) Dysphagia    4) Dysdiadochokinesia  
a) 1, 2 and 3 are correct    c) 1, 3 and 4 are correct  
b) 1, 2 and 4 are correct    d) 2, 3 and 4 are correct
- xii. The primary colours as per Young – Helmholtz theory of colour vision are  
1) Blue    2) Green    3) Yellow    4) Red  
a) 1, 2 and 3 are correct    c) 1, 3 and 4 are correct  
b) 1, 2 and 4 are correct    d) 2, 3 and 4 are correct
- xiii. The hormones secreted by adrenal cortex are:  
1) Cortisol    2) Aldosterone    3) Adrenaline    4) Dehydroepiandrosterone  
a) 1, 2 and 3 are correct    c) 1, 3 and 4 are correct  
b) 1, 2 and 4 are correct    d) 2, 3 and 4 are correct
- xiv. The body fluid compartments measurable by Dye dilution method are:  
1) Plasma    2) Intracellular fluid    3) Extracellular fluid    4) Total body water  
a) 1, 2 and 3 are correct    c) 1, 3 and 4 are correct  
b) 1, 2 and 4 are correct    d) 2, 3 and 4 are correct
- xv. The basic taste modalities are:  
1) Sweet    2) Sour    3) Salt    4) Spicy  
a) 1, 2 and 3 are correct    c) 1, 3 and 4 are correct  
b) 1, 2 and 4 are correct    d) 2, 3 and 4 are correct

**Questions xvi-xx are single response type questions**

- xvi. Anterograde amnesia is typically associated with damage to the:  
a) Amygdala    b) Hippocampus    c) Cerebellum    d) Thalamus
- xvii. D (delta) cells of pancreas secrete  
a) Insulin    b) Glucagon    c) Somatostatin    d) Pancreatic polypeptide
- xviii. Sarcomere refers to the portion of myofibril between:  
a) A and H band    b) Z line and A band    c) Two adjacent Z lines    d) A and I band
- xix. The first sign of puberty in females is:  
a) Thelarche    b) Menarche    c) Pubarche    d) Adrenarche
- xx. The mossy fibers in cerebellum make direct synaptic connections with:  
a) Granule cells    b) Purkinje cells    c) Stellate cells    d) Basket cells

**Long essays**

**(2x10=20)**

2. A 35-year-old female presents with weight gain, especially around her abdomen and face, fragile skin, easy bruising, acne, fatigue, mood swings, and irregular periods over the past 6 months. She also reports increased thirst and frequent urination. Examination reveals high blood pressure, a moon-shaped face, buffalo hump, purple striae, and thin, easily bruised skin.  
a) Name the most probable clinical condition and mention its cause. (1+1)  
b) Describe the physiological action of cortisol. (3)  
c) Explain the physiological basis of clinical features observed in the above case. (5)
3. Describe the origin, course, and termination of pain pathway from left lower limb. Add a note on referred pain. (7+3)

**Short Essays**

**(6x6=36)**

4. Describe the abnormalities of growth hormone secretion. (3+3)  
5. Describe the connections and functions of Basal ganglia. (4+2)  
6. Explain the pupillary light reflexes. Add a note on Argyll Robertson Pupil. (2+4)  
7. Explain the role of hypothalamus in the regulation of water and food intake. (2+4)  
8. List the hormones secreted by placenta. Add a note on fetoplacental unit. (2+4)  
9. Describe how impulse travels across the neuromuscular junction. Add a note on neuromuscular blockers.

**Short Answers**

**(6x4=24)**

10. Draw and label sodium – potassium ATPase.  
11. Give the physiological basis of impedance matching.  
12. Physiological basis of oral contraceptive pills.  
13. Draw and label the pathway of stretch reflex.  
14. Physiological basis of polyuria and polydipsia in diabetes mellitus.  
15. Draw and label taste pathway.

\*\*\*\*\*